shoveled into the bag for export. For further information those interested may address the editor of *Tropical Life,* 112 Fenchurch street, E. C. London.

UNIVERSITY AND EDUCATIONAL NEWS

THE College of Agriculture of the University of the Philippines, situated at Los Banos, opened on June 14, with about sixty students. E. B. Copeland is dean and professor in botany; Harold Cuzner, professor of agronomy; Edgar M. Ledyard, professor of zoology, and S. B. Durham, professor of animal husbandry. The university opened a school of fine arts in Manila at the same time; it has no entrance requirements, and its registration is above 400. A college of veterinary science, for high school graduates was announced to open at the same time but there was only one applicant for admission. The secretary of public instruction, Judge Newton W. Gilbert, is acting president of the university.

PROFESSOR K. E. GUTHE, of the University of Iowa, has accepted a call as professor of physics to the University of Michigan.

DR. BURTON E. LIVINGSTON, staff member, Department of Botanical Research of the Carnegie Institution of Washington, has accepted an appointment as professor of plant physiology in the Johns Hopkins University. He will assume his new duties with the opening of the next academic year.

IT is stated in the daily papers that Professor W. J. V. Osterhout, of the department of botany of the University of California, has accepted a call to Harvard University.

MR. WILLIAM T. HORNE has resigned his position as plant pathologist of the Cuban Agricultural Experiment Station to become assistant professor of plant pathology in the University of California.

MRS. ELLA FLAGG YOUNG, principal of the Chicago Normal School since 1905 and previously professor of education in the University of Chicago, has been elected superintendent of Chicago's public school system.

JOSEPH S. CHAMBERLAIN, Ph.D. (Johns Hopkins), chief of the laboratory of Cattle Food and Grain Investigations of the Bureau of Chemistry, U. S. Department of Agriculture, has been appointed associate professor of chemistry in the Massachusetts Agricultural College.

MR. A. G. CHRISTIE, formerly in the steam-turbine departments of the Westinghouse and Allis-Chalmers companies, has been appointed assistant professor of steam engineering at the University of Wisconsin.

PROFESSOR L. P. DICKINSON, of the electrical engineering department of Lafayette College, has been appointed professor of electrical engineering at Rhode Island State College to succeed Professor Gilbert Tolman, who recently resigned to accept a chair at Colby College.

DR. ROBERT F. SHEEHAN has been appointed professor of hygiene at the University of Buffalo to succeed Dr. Henry R. Hopkins, who has been appointed emeritus professor of hygiene. Dr. Herbert Hill has resigned as professor of chemistry, toxicology and physics.

DISCUSSION AND CORRESPONDENCE

THE DUTY OF PUBLISHING

THE reason for all scientific investigation, that which not only justifies but even demands it, is the help its results, when known, will be to the human race through the fuller knowledge men will then have of the laws of the universe in which they are placed and from which they can not escape.

From this it follows that no investigation need be made—the labor and the expense of it are to no purpose—unless the results are to be published, that is, brought to the attention of those, preferably as many as possible, who are most likely to use this information in a manner helpful to themselves and to the rest of the world.

How much better it would have been if Willard Gibbs, for instance, instead of printing accounts of his investigations in a journal of most limited circulation, had published where the whole scientific world could have seen them. For nearly a generation his remarkable discoveries were of no honor either to himself or to the institution with which he

was connected, nor of any help to the progress of science. During all this time they remained hidden in that obscurity to which they at first had been consigned, and from which they were rescued only after many of them had been rediscovered and properly published.

Another case of inadequate publication, and there have been many similar ones, is the first account of a method for detecting optically the presence of objects beyond the highest power of the microscope, as ordinarily used. This appeared in a weekly engineering journal which biologists, and others interested in high-power microscopy, probably rarely saw and never read. Mr. Dubern had as well never made his important discovery. For more than twenty years the world knew nothing of it, and even then not until, and because, some one else had rediscovered and really published the same method.

There is a piece of biblical wisdom that warns against casting pearls where they will receive but scant attention, and the same thing applies to the printing of papers where they don't belong. A paper out of place is a paper unpublished, no matter how many may see it. But unwise as it may be to send an article to an inappropriate journal, it is just as useless to give it to one that is without circulation. No scholar, however able, can reasonably expect to do much good who confines the accounts of his discoveries to the "Transactions of the Village Academy," or to the "Publications of the Humdrum Laboratory"—publications, both of them, for which there is neither room nor proper reason. No room, because not even libraries, much less individuals, can handle that unnecessary and unworthy mass of pamphlets of which these are ideally typical; nor proper reason, since commonly the existing journals are capable of publishing all that is worth printing.

It is true that once in a while there is a real necessity for a new journal, but it should not be started till the need for it is urgent, for the cost of taking and the burden of handling them is already beyond the means and the ability of the private scholar, and fast becoming a serious tax on even large libraries. A new journal unnecessarily added is nothing short of an unwarranted imposition, and it deserves to be treated as such. But for all that, there are many of just this kind. They exist because of that foolish pride that puffs itself up in a vain effort to imitate the ox; or else, and often, because of the abominable necessity for political buncombe. In either case one article is quite as good as another, and about as likely to be printed, provided only that it is lengthy, learnedly muddled and handsomely illustrated. These, of all others, are to be avoided in every way possible. To print in them is not to publish, for they are neither shelved by libraries nor read of scholars.

When an investigation has but a single interest, astronomical for instance, it is sufficient and proper for it to appear in but one journal, some astronomical one in this case, of wide circulation. When, however, its interests are distinctly twofold then the purpose of the investigation—the spread of helpful knowledge—is best met by publishing it in an appropriate journal of each of the sciences which it concerns. To do less than this is for the investigator to neglect his duty, to hide his light under a bushel, which is just as reprehensible in the scientific as it is in the moral world. To him that discovers let honor be given, for he is a genius; but to him that discovers and publishes let there be given double honor, for he is a genius that has done unto others as he would have others do unto him.

The necessity of treating a scientific question one way for one purpose, and another for a different purpose, has led to several legitimate classes of journals and publications. Those of a semipopular type, of which SCIENCE and *Nature* are good examples, are especially adapted to addresses before scientific societies, book reviews, notes and brief articles of general interest. In a sense these are what might be called the scientist's newspapers, delightful and valuable to every scholar, no matter what his specialty.

Distinctly different from these, though like them in the sense that their pages are open to

any one who has the proper material to contribute, are the technical journals, whose contents generally are concisely written and therefore, while of the highest value, commonly intelligible to only a limited class of specially trained readers. They form the library, for which any one can subscribe, of the creative scholar, to which he turns for the most exact and for the most accessible information on every subject in which he is interested. It is here that the scientist is expected to publish in condensed form, for the use of his fellow specialists, his every discovery, the methods and the results of his every investigation; and that too as soon as possible.

Entirely different from either of the foregoing types, and for a different purpose, are the annals, year books, bulletins and other publications of observatories, societies, government bureaus and departments. Here the pages are seldom open save to those officially connected with the particular institution, society or bureau specifically represented. In most cases they appear irregularly at long intervals and are restricted in circulation practically to a limited free distribution. They are for the purpose of preserving for reference in extended form, with all helpful minutiæ, those investigations of the particular observatory or bureau concerned which, because of their length or their diffuseness, are not adapted to the technical press.

For the sake, therefore, of reaching a larger number of interested readers, and often, too, for the sake of an earlier publication, it is desirable to send to the technical journals many articles that are expected to appear in a more extended, or even in substantially the same, form in official bulletins and annals. And this is all the more important in the case of those articles that also concern some science in addition to the one commonly dealt with in the bulletins or annals in which they appear.

The scientific public expects that whatever one may print officially he will, as soon as possible, come out in the open with what he believes to be contributions to knowledge, and submit them where they will be accepted or rejected according to their merits; and where if accepted they will be read and subject to criticism. This is publishing in the true sense of the term, and is incumbent upon every investigator. Confining an article to an official bulletin, however excellent and necessary it may be, often amounts to but little more than mere printing for private distribution, because scholars do not and will not wade through tedious bulletins and annals for that which they expect to find in a more condensed form in more accessible journals.

When, for official reasons, the author is not free to do as he chooses, publication of any kind must have the sanction of the proper authority. Commonly, however, those in authority are glad to grant this privilege to any one capable of writing a paper acceptable to the technical press. In fact they often urge it upon him for the sake of those who can profit by such articles, and incidentally for the well-deserved encouragement of the authors themselves, and for the credit their work will bring to the institutions with which they are connected. They realize that it is an honor to any man to have his papers accepted by a discriminating scientific journal, and that the reputation of any institution is that of its work that is known and no more.

Every scientific question should be investigated carefully, honestly, thoroughly; the results published quickly, openly, fully.

To discover is the scientist's reward, to publish is his duty.

W. J. HUMPHREYS

REFLEX ACTION AFTER DEATH

ON the afternoon of April 27, 1909, while returning from the day's work on precise leveling, over the Santa Fe Railroad, to Goffs, California, the velocipede car on which I was riding passed over a rattlesnake, which was lying between the rails. It rattled, and I stopped the car and went back to investigate. It was what is locally known as the "sidewinder," by which I understand it to be the horned rattlesnake, or *Crotalus cerastes*. It was lying stretched to nearly its full length, and rattled again, without coiling. Taking a